

Summary of Paper No. 2

* **Title in English:** Origin of chert within the Turonian carbonates of Abu Qash Formation Abu Qash area Egypt: Field petrographic and geochemical perspectives.

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English Summary

This paper tries to elucidate the origin of the siliceous rocks (cherts) within the Turonian flint-bearing cherty limestone member of Abu Qash Formation Abu Qash area north Western Desert Egypt. Understanding the formation mechanism of the studied chert was gained through field and petrographic investigations supplemented by geochemical analyses of both cherts and host Turonian carbonates. The field observations reveal that the chert is found in two forms: banded and nodular. The microscopic investigation determined that the cherts exhibit two types of silica: replacement silica (cryptocrystalline and microcrystalline quartz) and silica cement (length-fast chalcedony and mega quartz). The chert texture corroborates that the cemented authigenic silica was formed diagenetically by the replacement and void-filling of the host carbonate rocks. The silica was most likely derived from the biogenic opal-A of the siliceous radiolarian tests. The silica-phase transformation started with the dissolution of the biogenic opal-A and precipitation of opal-T. Subsequently opal-T was recrystallized into crypto- and micro quartz at low pH and high temperature. The length-fast chalcedony and mega quartz occur later as infill to the cavities and pore spaces. The formation of chert is interpreted to be a result of mixing marine-meteoric waters. The effect of the freshwater diagenesis on carbonates is manifested by the dissolution of the allochems precipitation of granular drusy and blocky calcite (meteoric cements) aggrading neomorphism of matrix and calcification of the skeletal particles. Geochemical analyses of the host carbonates indicate nearly flat REE patterns and absence of a negative ϵ_{Nd} anomaly. This confirms the deviation from the typical seawater and supports the effect of phreatic meteoric water in the chert formation. The paragenetic relationships reveal that the chertification process was performed after dolomitization and before the carbonate meteoric cementation.

Keywords: Abu Qash chert Egypt geochemistry Petrography Turonian.